

Integrated Cognitive Assessment: Combining Measurement, System, and Mission, Phase I

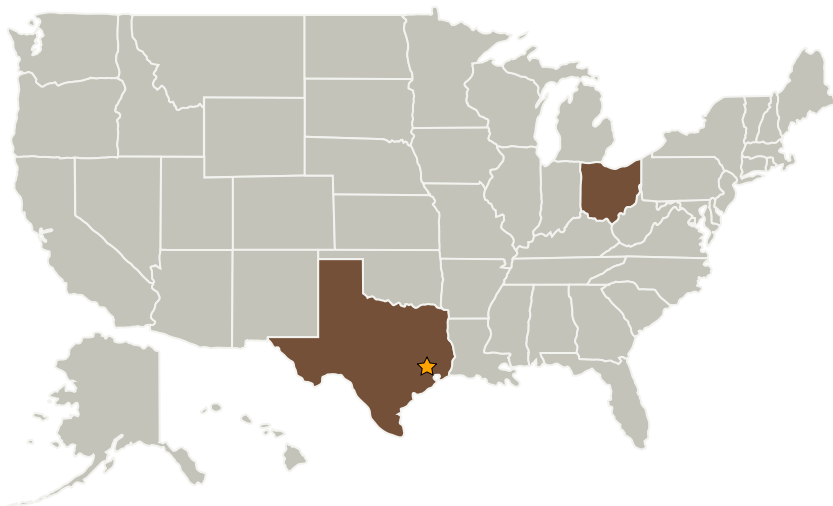
Completed Technology Project (2008 - 2008)



Project Introduction

Existing cognitive performance test batteries consist of synthetic tasks that, while they may probe isolated cognitive functions, provide an incomplete and unconvincing picture of an individual's true cognitive capacity within the total context of space missions. In essence, they are 'laboratory' measures that appear unrelated to the real-world environment. This leads to user non-compliance or rejection. The present proposal describes a technique for integrating traditional cognitive performance measures with assessment of the system and mission in which the individual must operate. This yields quantified measures of the person's cognitive ability to perform specific jobs in space. Specifically, an entertaining and scientifically rigorous assessment tool is integrated with a sleep/fatigue model and a quantified workload estimate for each task. This is accomplished by selecting tests based on task analyses of what the astronaut actually has to do, using the Fatigue Avoidance Scheduling Tool (FAST) to predict performance capacity as a function of sleep/rest, and integrating a mathematical vector to quantify the workload of specific tasks. The resulting "Person-System-Mission (PSM) index" provides a totally new and unique way not only to assess present cognitive capability, but to diagnose specific causes of decrement, and to suggest remedial actions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
NTI, Inc.	Supporting Organization	Industry	Fairborn, Ohio

Primary U.S. Work Locations

Ohio	Texas
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Robert O'donnell

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.5 Revolutionary Communications Technologies
 - └ TX05.5.1 Cognitive Networking